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SWOT METHODOLOGY: A STATE-OF-THE-ART REVIEW FOR THE PAST, A FRAMEWORK FOR THE FUTURE

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Abstract. The SWOT analysis is the process of exploring the internal and external environments of an organization and extracting convenient strategies based on its strengths, weaknesses, opportunities and threats. This paper presents a literature review of SWOT analysis, based on a reference bank of about 557 papers established through searching various databases. This paper reviews papers that have been published up to the end of 2009. The origination and historical development of SWOT are explained first, followed by a survey on trends & classifications in SWOT papers including journals, countries, years, people & contents. Then a categorical analysis is conducted about application area and scope of SWOT. Also a methodological development of SWOT is discussed. Finally, concluding remarks and a few suggestions and challenges are presented for future studies. It is hoped that the paper can serve the needs of researchers and practitioners for easy references of SWOT studies and applications, and hence promote SWOT future development.

Keywords: SWOT, TOWS, review paper, state of the art, strategic planning, strategy.

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JEL Classifications: M00, M30.

1. Introduction

Among many fads and fashions emerging constantly in strategic management field, during the recent decades, the SWOT framework has enjoyed outstanding popularity among both researchers and practitioners. This tool includes environmental analysis (the process of scanning the business environment for threats and opportunities) and the organizational analysis (the process of analyzing a firm‘s strengths and weaknesses) (Fig. 1).

SWOT analysis is a widely used tool for analyzing internal and external environments in order to attain a systematic approach and support for decision situations.

	Strengths	Weaknesses
Opportunities	SO strategies	WO
Threats	ST	WT

Fig. 1. SWOT matrix

The impressive ability of SWOT is the matching of specific internal and external factors, which provides a strategic matrix that makes sense. It is essential to note that the internal factors are within the control of the organization, for instance, finance, operations, marketing, and other areas. On the other hand, the external factors are out of the organization›s control, such as the economic and political factors, new technologies, and its competition. The SWOT matrix consists of four combinations which are called the maxi-maxi (strengths / opportunities), maxi-mini (strengths/ threats), mini-maxi (weaknesses/opportunities), and mini-mini (weaknesses/threats) (Weihrich 1982).

Although the SWOT analysis dates back to 50's and 60's[1], Weihrich (1982) that introduced SWOT matrix as a tool for situation analysis, can be regarded as the most important reference in this field that has provided some classic examples.

After that time, SWOT has been pointed in most of the references of strategic planning. Although this analysis seems out of date in comparison with recent approaches such as resource-based planning and competency-based planning Dyson (2004) pointing out the relation between SWOT and two above approaches could show that SWOT is such a flexible framework which can combine with newer methods to offer novel methods. Although strategic planning has a lot of instruments and many approaches, thousands of researches and hundreds of papers have utilized SWOT in recent years. So we will review those papers in section 2.

Papers of SWOT applications in different industries will be mentioned in section 3. Also the numerous papers that have mentioned the SWOT weaknesses and shortages and combining other instruments and techniques, have tried to modify its methodology will be described in section 4. Integrating SWOT with other methods is reviewed in section5. Finally, concluding remarks on SWOT trends, methodology and applications in published papers will be presented in section 6.

The aim of this paper is reviewing the literature of SWOT to answer questions such as: "what research methods are most commonly used?", "what topics and areas are treated most often in the SWOT field?", "what is the scope of these studies?" and "which journals or countries stand out with highest number of papers using this technique?". Such

[1] SWOT analysis originated from efforts at Harvard Business School to analyze case studies. In the early 1950s, two Harvard business policy professors, George Albert Smith Jr. and C Roland Christensen, started to investigate organizational strategies in relation to their environment. In the late 1950s, another HBS business policy professor, Kenneth Andrews, expanded on this thinking by stating that all organizations must have clearly defined objectives and keep up with them. In the early 1960s, classroom discussions in business schools were focusing on organizational strengths and weaknesses in relation to the opportunities and threats (or risks) in their business environments. In 1963, a business policy conference was held at Harvard, where SWOT analysis was widely discussed and seen as a major advance in strategic thinking (Panagiotou 2003).

questions have already been raised with the objective: “to improve our knowledge in this field”.

It is hoped that this paper could serve the needs of interested readers for references of SWOT studies and applications, and hence promote the future development of SWOT.

2. Review of published SWOT papers

2.1. Data collection

We decided to focus our study on papers published in refereed journals, not therefore including sources such as books or papers presented at conferences. This was based on the belief that academics and practitioners usually prefer using journals to acquire and disseminate novel knowledge. Other resources, such as books, are generally confined to the dissemination of previously established knowledge.

Therefore the papers were checked that there was ‚SWOT‘ or ‚TOWS‘ acronym in title, abstract or keywords of them.

To conduct this literature review, databases have been searched and papers that have been published in indexed journals, **up to the end of 2009**, were recognized. These databases are:

- Web of Knowledge
- Science direct
- Blackwell
- IEEEXplore
- Oxford University Press
- ProQuest
- Springer
- Wiley
- SAGE
- SCOPUS
- IOS Press
- Beech tree publishing
- Project Muse
- Group Dynamic
- Emerald insight

In total, 557 papers on SWOT were found in related databases, which have been evaluated in this literature review, however total number of papers seemed to be more than 557 cases, due to the papers had been found on more than one databases.

2.2. Trends & Classifications in SWOT papers

Based on our survey, papers on SWOT have been published for 28 years, the earliest dates back to 1982. No paper on SWOT was published between 1982, when the earliest paper was released, and 1987.

SWOT analysis is not considered very long lasting method. Actually it did not use to be common so much before 1993, but the number of its publications has soared from 2000 and the largest number of papers (72) was published in 2008 as was shown in Table 1.

In order to better analyze the growth, we divided the period under study into six categories. Each category shows the number of published papers every five years until 2009 as can be seen in Fig. 2. The growth in the number of papers in recent years shows that interest in SWOT analysis is increasing among researchers. It can be observed in Table 1 that 54% of whole papers on SWOT were published in 2005–2009 as was shown in Fig. 2.

Table 1. Number of papers on SWOT in each year

Year	Number	Percent (%)	Year	Number	Percent (%)
1982	1	0.2	1996	11	2.0
1983	0	0.0	1997	10	1.8
1984	0	0.0	1998	15	2.7
1985	0	0.0	1999	14	2.5
1986	0	0.0	2000	28	5.0
1987	1	0.2	2001	21	3.8
1988	1	0.2	2002	35	6.3
1989	3	0.5	2003	43	7.7
1990	0	0.0	2004	48	8.6
1991	2	0.4	2005	63	11.3
1992	2	0.4	2006	50	9.0
1993	6	1.1	2007	48	8.6
1994	8	1.4	2008	72	12.9
1995	7	1.3	2009	68	12.2
			Total	557	100

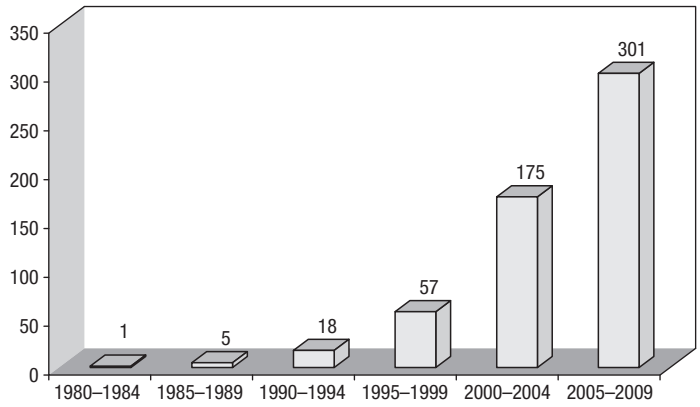

Fig. 2. Number of papers on SWOT

Among 425 papers which their origins are recognized, about forty five percent (45%) of whole SWOT papers were provided by three countries: UK, USA, and India[2]. Top ten ranked countries in providing SWOT papers were shown in Table 2.

'Marketing Intelligence & Planning' and "Health Policy" are the journals which have published the highest number of SWOT papers (9 papers). 'Long Range Planning' occupies the third rank with 6 papers (Table 3).

Application variety of SWOT caused to publish 557 papers in 424 journals!

Table 4 ranks authors in order of the number of their papers. Also, the number of papers on which the author was the first among collaborators is seen as well in this table. If two authors had an equal rank, then the number of papers on which their name appeared first was compared. We should appreciate Weihrich, who was the initiator of the method.

Table 2. Top 10 countries on SWOT papers

Rank	Country	Number of paper
1–2	UK, USA	52
3	India	50
4	China	35
5	Turkey	15
6	Germany	13
7	Iran	12
8–9	Finland, Australia	11
10	Poland	10

Table 3. Top 10 journals on SWOT papers

Rank	Journal	Number of paper
1–2	Marketing Intelligence & Planning Health Policy	9
3	Long Range Planning	6
4	Promet-Traffic & Transportation	5
5–10	Management Decision	4
	Managerial Auditing Journal	
	Forest Policy and Economics	
	Journal of the Institution of Engineers British Food Journal Ekonomicky Casopis	

[2] Notice: some of these articles were presented by two or more countries.

Table 4. Top 10 authors on SWOT papers

Author	Number of papers as first author	Number of other papers	Total
Kajanus, M.	1	6	7
Ghazinoory, S.	5	1	6
Kangas, J.	2	4	6
Kurttila, M.	2	4	6
Arslan, O.	3	1	4
Lee, S. F.	3	1	4
Er, I. D.	0	4	4
Weihrich, H.	3	0	3
Kumar, S.	3	0	3
Lee, K. L.	3	0	3

Table 5. Top 10 cited papers on SWOT until July, 1th, 2010 in Scopus

Author	Year	Paper title	Cited times
Jackson *et al.*	2003	Recent Research on Team and Organizational Diversity: SWOT Analysis and Implications	114
Rizzo and Kim	2005	A SWOT analysis of the field of virtual reality rehabilitation and therapy	67
Weihrich	1982	The TOWS Matrix A Tool for Situational Analysis	64
Kurttila *et al.*	2000	Utilizing the analytic hierarchy process AHP in SWOT analysis – a hybrid method and its application to a forest-certification case	64
Hill and Westbrook	1997	SWOT Analysis: It's Time for a Product Recall	51
Ho	2008	Integrated analytic hierarchy process and its applications – A literature review	39
Gordon *et al.*	2000	Strategic planning in medical education: enhancing the learning environment for students in clinical settings	36
Hackbarth and Kettinger	2000	Building an E-business strategy	32
Dyson	2004	Strategic development and SWOT analysis at the University of Warwick	27
Houben *et al.*	1999	A knowledge-based SWOT-analysis system as an instrument for strategic planning in small and medium sized enterprises	24

To assess SWOT papers based on citation frequency, we presented top 10 papers based on their citation counts[3]. These papers have been cited 24 or more times in data banks (Table 5). The largest number of citation of a paper (114) is belonged to Jackson *et al.* (2003). Also Rizzo and Kim paper (2005) and Weihrich (1982), with 67 and 64 times of citation, occupied second and third rank.

2.3. Approaches in SWOT studies

The contents of SWOT papers could be divided into methodological, case study and applied-methodological papers:

- *Methodological* papers provide a new idea on SWOT structure and its concept.
- *Case study* papers guide the practice, offer the recommendations for action and explain the stages to be fulfilled.
- *Applied-methodological* papers are mixture of methodological and case study approaches, on the other hand, these papers have modified or changed the SWOT method, so that they can provide an adaptive method and adjust SWOT to their own problem.
- Major part of SWOT studies (91%) are case study in different areas and industries. Meanwhile only 5% of whole papers are allocated to methodological category and 4% of them is allocated to applied-methodological (Table 6 and Fig. 3).

Table 6. Approaches in SWOT papers in each year

	1982–92	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	total	%
Methodological	2	–	1	–	1	1	2	1	2	2	1	1	5	1	1	2	2	2	27	5
Case study	8	6	7	7	10	9	12	13	22	16	33	41	40	61	48	43	68	64	508	91
Applied-methodological	–	–	–	–	–	–	1	–	4	3	1	1	3	1	1	3	2	2	22	4

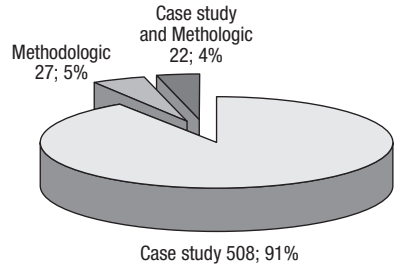

Fig. 3. Approaches in SWOT papers (percentage)

[3] The information about cited times is exist in SCOPUS data bank for each article.

3. Application areas and scopes of SWOT papers

A review of most frequent areas and scopes which SWOT has been applied in case studies or applied-methodological papers is presented in Table 7. The main problem in making of this review is that there is no classification on SWOT applications in previous papers. Therefore we have classified them based on our reading of the papers.

Table 7. Areas and scopes in case studies and Applied-methodological papers on SWOT

Area	Content	number	percentage
Health & healthcare	life scenario planning, elderly care, Primary Care, hospital, public health, nursing, mental care, …	67	12.6
General management of companies	Management and strategic planning in business, companies, firms, Offshore outsourcing, …	37	7.0
Marketing & market planning	Marketing and market planning at local, national, regional and international levels	32	6.0
Learning & education	Learning & education at school, university & organization	28	5.3
Agriculture	Fishing, feed and food, dairy, olive, farming, …	88	16.6
Medicine & pharmacy	clinical diagnosis, surgery, dental, pharmacy, …	25	4.7
IT	Internet, information, computer, software, …	22	4.2
Environment	Cleaner production, wastewater, solid waste, …	30	5.7
Textile	Textile, clothing, garment, apparel, …	16	3.0
Forestry	research station, forest management, forest and Park, …	25	4.7
Tourism	Rural, urban, cruise, …	39	7.4
Manufacturing	Shipbuilding, machine tools, Machinery, motor vehicles, …	12	2.3
Transportation	Ports, airline, airport, sea passenger, road, …	20	3.8
Metal	titanium alloys, metal powder, foundry, …	10	1.9
Electronic	Cable TV, capacitor, …	6	1.1
Library	Library Fundraising, library strategic planning, …	4	0.8
Construction	Construction	7	1.3
Oil & gas	Oil and natural gas	4	0.8
Military	Military	2	0.4
Cosmetic	Cosmetic	3	0.6
Financial	Finance	3	0.6
The rest	Newsprint, service, banking, hydraulic power generation, NIS, program development, legislation, gaming, foreign policy, economic policy, national economic, …	53	10.0
Total		530	100

According to Table 7, some of the most common fields of SWOT applications (according to Table 7) are reviewed in below:

3.1. Agriculture

It is a bit surprising that the fields which SWOT is used the most, is agriculture and its sidelong fields – while business fields and industries may be more expected to be involved in strategy formulation and implementation process.

The first work in this field is a paper by Faesel and Hill (1995), though using SWOT in agriculture prevailed almost since 2002 and many papers published since then. An interesting point is that these papers are mostly belonging to developing countries (particularly India) and them often assessing agriculture condition in a specific geographic region rather than strategic positioning of a special organization. For example, Wah and Merican (2009) released a paper which can be mentioned here.

3.2. Health& health care

Regarding to the big amount of journals in health field, it is not surprising that the number of papers in this field is big as well, so one of the first applied SWOT papers (Lanzotti 1991) is related to this field. The number of papers published in this field has reached its peak within 2002 and 2003 but it has decreased in recent years.

In addition, the most common usage of SWOT in health field is related to strategy formulation of research and treatment centers. A paper by Lane *et al.* (2008) can be mentioned as an example.

3.3. Tourism

Using SWOT in tourism field has started later than other fields; and the first article is Ravindranath (1997). But this trend has been ascending so it has increased every year so the biggest number has published in 2009.

The most of articles in this field assess tourism potentials in a particular geographic area or a special city (mostly in developing countries) and several papers have published assessing tourism in provinces of China, as an example a paper by Gu ShiCheng *et al*. (2009) can be mentioned.

3.4. General management of companies

Initial and predictable application of SWOT has been in the field of companies management and strategy formulation for them in corporate level or one of its functions (of course, SWOT application in marketing will be separately described in the next section). After the advent of SWOT, the published papers within the first years focused on strategy formulation for companies. Even the first one which was Weihrich's work, (1982) presented a real example for Volkswagen Company. In addition, the most cited SWOT article (Jackson *et al*. 2003) belongs to this field.

3.5. Marketing& market planning

Since the main application of strategy planning has been in marketing, not surprisingly there are lots of articles in this field. The first two (Giles 1989) (Piercy, Giles 1989) have been published in Marketing Intelligence & Planning. As another example, Novicevic *et al.* (2004) can be mentioned.

3.6. Environment

The first article in this field is belonging to Glasson (1999) and no paper published up to 2002. Then, the significant number of papers, published in this field mainly resulted from papers which have been published in recent 3–4 years.

An interesting point here is most of the papers of environment field have conducted in national level, for instance Ghazinoory and Huisingh (2006). In addition Lozano and Valles (2007) article is one of the good ones.

3.7. The rest

10 percent of whole categorized papers belong to "the rest" category including Newsprint, service, banking, hydraulic power generation, NIS, program development, legislation, gaming, foreign policy, economic policy, national economic and etc. As it is seen, many of these subjects are in macro level and topics such as policy making (for example, Sharma *et al.* 2009), macroeconomics (for example, Diskiene *et al.* 2008) and national innovation system (for example, Ghazinoury and Ghazinoori 2006) have been conducted.

The number of these kinds of papers is increasing constantly; it means that in many new fields, SWOT, as an analytical tool is being used.

3.8. Levels of SWOT applications

SWOT is generally used for policy making, decision making and strategy making (or planning). In the review of SWOT papers, we identified that SWOT analysis has been used in three levels: corporate, national and regional planning. 33% of case study and applied-methodological papers were about national planning. 3% were about regional planning, and 64%were in corporate level (Fig. 4).

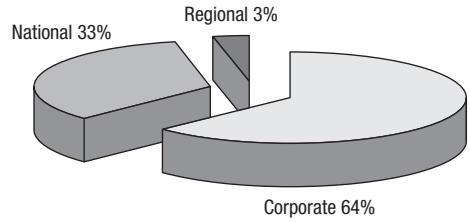

Fig. 4. Three levels that SWOT analysis has been used for them

4. Methodological development of SWOT

As SWOT framework does not have a strictly defined structure, sometimes it becomes an art more than a science, which makes it difficult for practitioners to use SWOT and extract strategies of it. However, there have recently appeared many methodological works on SWOT to make it more rigorous and operational. Most of these researchers have pointed to SWOT difficulties and then proposed some solutions to modify its shortcomings. These works are briefly summarized below for practitioners to understand and to apply SWOT in a more objective and precise way.

Weihrich (1982) introduced SWOT and pointed to two difficulties in applying this method:

– *Time dimension in* SWOT *matrix;*
– *Complexity of Interactions of Situational Factors.*

Strenght / Opportunity	1	2	3	4	5	6	7	8	9	10
1	+	0	+	0	0	+	+	0	0	0
2	+	0	0	+	0	0	0	+	0	0
3	0	0	0	+	0	0	0	0	0	+
4	+	+	+	0	0	+	0	+	+	+
5	+	0	+	0	0	0	+	0	0	0
6	+	0	0	0	+	0	0	0	+	+
7	+	+	0	+	+	0	+	+	+	+
8	0	0	0	0	0	+	0	0	+	0
9	+	0	0	+	0	0	0	0	0	0
10	+	+	0	0	+	0	0	0	0	0

Fig. 5. Interaction matrix (Weihrich 1982)

He proposed preparing several SWOT Matrixes at different points of time to solve the first and using interaction matrix to solve the second (Fig. 5). None of them unfortunately was noticed in practice.

After 1982 for many years, no methodological modification in SWOT happened, Even Hill and Westbrook (1997) said:

"It may be time to relinquish our fondness for SWOT analysis which seems now to have passed its sell-by date, because of fundamental concerns about the intrinsic nature of SWOT analysis such as:

– The length of the factors lists;
– No requirement to prioritize or weight the factors identified;
– Unclear and ambiguous words and phrases;
– No resolution of conflicts;
– No obligation to verify statements and opinions with data or analyses;
– Single level of analysis is all that is required;
– No logical link with an implementation phase".

Also Pickton and Wright (1998) introduced the SWOT limitations (Fig. 6).

Subsequent papers gradually in addition to pointing out SWOT limitations, proposed the solutions to modify it:

Beeho and Prentice (1997) said that the major attractions of SWOT analysis are: first, it is familiar and, second, it is ‚user friendly', as it does not require the need for complex information or computer systems. Indeed, SWOT analysis offers a simple structured approach to identifying a company's strengths and weaknesses and comparing these to opportunities and threats faced by the organization due to its environment. But it has some of shortcomings, for example:

– *SWOT analysis is global to a product (or attraction in this case) and can be unfocused;*

Inadequate definition of factors	Lack of prioritization of factors	Over-subjectivity in the generation of factors: compiler bias
• Factors which appear to fit into more than one box/category • Factors which do not appear to fit well into any box/category • Factors described broadly: lack of specificity • Lack of information to specify factors accurately	• Factors which arc given too much emphasis • Factors which are given too little emphasis • Factors which are given equal importance	• Factors missed out: lack of comprehensiveness • Serendipity in the generation of factors • Disagreement over factors and to which box/category they belong • Factors represent opinions not fact

Fig. 6. Limitations of SWOT (Pickton and Wright 1998)

– *Owing to its simplistic nature and ease of use, the technique has been used in a slack manner and is susceptible to subjectivity and bias from managers who can present an unrealistic appraisal of company attributes.*

To refinement of it, a new type of analysis has been proposed, ASEB (activities, settings, experiences, benefits) grid analysis.

Ramos *et al.* (2000) solving the problem of non-weighting factors in SWOT used a model which supersedes the opportunities and threats of SWOT by the key issues in the environment when comparing their impact on the identified strengths and weaknesses. This SWOT model scrutinizes the main strengths and weaknesses against each key issue in the environment. A score of "+" (or a weighted "++") is proposed when there is a benefit to the organization such as a strength that allows the sector to take advantage of or to counteract a problem arising from a key environmental change or when a weakness would be offset by the environmental change. A minus (or a double minus) is marked when there is an opposed effect on the organization, when strength would be reduced by the environmental change or a weakness would prevent the sector from overcoming the problems associated with or accentuated by an environmental change.

Hussey (2002) faced several flaws in SWOT exercises. For example:

– *It is much harder for managers to identify strengths than things that they see as wrong with the organization.*
– *The insight of many managers is operational rather than strategic and consequently much of what ends up being listed is not particularly useful.*
– *It is a mistake to assume that managers always have the information and knowledge that enables them to perceive a strategic strength or weakness.*
– *It is too easy for something positive to be perceived as better than it is.*
– *The power and influence of managers involved in a SWOT process is not equal.*
– *Some managers describe an effect as a weakness and do not get to the causes.*

He thinks: "SWOT can't ever become really useful unless it is related to a more careful analytical underpinning".

So in the next section, we will mention some exercises in this area.

5. Integrating SWOT with other methods

For improving the effectiveness of SWOT, many researchers have integrated it with other methods (especially analytical and quantitative methods).

Rudder and Louw (1998) proposed the SPACE matrix as a basis for SWOT analysis this matrix determining the organization's strategic posture in the industry makes use of two internal dimensions (financial strength and competitive advantage) and two external dimensions (industry strength and environmental stability). The firm's strategic posture is then classifies broadly as: aggressive, competitive, conservative or defensive. Also, Valentin (2005) introduced Defensive/Offensive Evaluation (DOE) as an effective alternative to SWOT analysis.

Houben *et al.* (1999) believed that "many companies often only have vague ideas of their competitive strengths and weaknesses, opportunities and threats". Then they used

expert systems for developing a knowledge-based system that can assist managers of small and medium sized companies in performing a SWOT analysis.

Proctor (2000) suggested that executives can possess a powerful tool for generating sustainable strategies and specifying objectives, by combination the three techniques of cross-impact analysis, the TOWS matrix and brainstorming,

One of the most important researches to complete SWOT is the papers that have been presented by a Finnish team. They used Analytic Hierarchy Process (AHP) at least in 7 papers and combined it with SWOT to innovate a hybrid method[4]: AWOT. Kurttila *et al.* (2000) believe that when using SWOT, the analysis lacks the possibility of comprehensively appraising the strategic decision-making situation; merely pinpointing the number of factors in strength, weakness, opportunity or threat groups does not pinpoint the most significant group. In addition, SWOT includes no means of analytically determining the importance of factors or of assessing the fit between SWOT factors and decision alternatives.

For solving these problems, they proposed a hybrid method (AWOT) with following steps:

- *Step 1. SWOT analysis is carried out;*
- *Step 2. Pairwise comparisons between SWOT factors are carried out within every SWOT group;*
- *Step 3. Pairwise comparisons are made between the four SWOT groups;*
- *Step 4. The results are utilized in the strategy formulation and evaluation process.*

These researchers have utilized this algorithm with some changes for a forest-certification case (Kurttila *et al.* 2000), for a multinomial logit model analysis in forest management decisions of private forest owners (Kurttila *et al*. 2001), assessing the priorities among resource management strategies at the Finnish Forest and Park Service (Pesonen *et al.* 2001), evaluating the management strategies of a forestland estate (Kangas *et al.* 2003), using of value focused thinking in tourism management (Kajanus *et al.* 2004) and adapting modern strategic decision support tools in the participatory strategy process in a forest research station (Leskinen *et al.* 2006). They have used combination of SWOT with another techniques such as statistical analysis, value focused thinking and Multiple Criteria Decision Support (MCDS) methods.

Applying the combination of SWOT and AHP in forest industry is not confined to Finnish researchers but Shrestha *et al.* (2004) have used this method for exploring the potential for Silvopasture adoption.

Using structured methods of Multiple-Attribute Decision Making (MADM) especially AHP to quantify SWOT has been continued by Chang and Huang (2006) (Fig. 7). Also a review of integrated analytic hierarchy process and its applications with SWOT has been done by Ho (2008).

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[4] It should be noted that before them Yahya (1997) had used SWOT for cross-checking the result of AHP method, but he had not integrated the method.

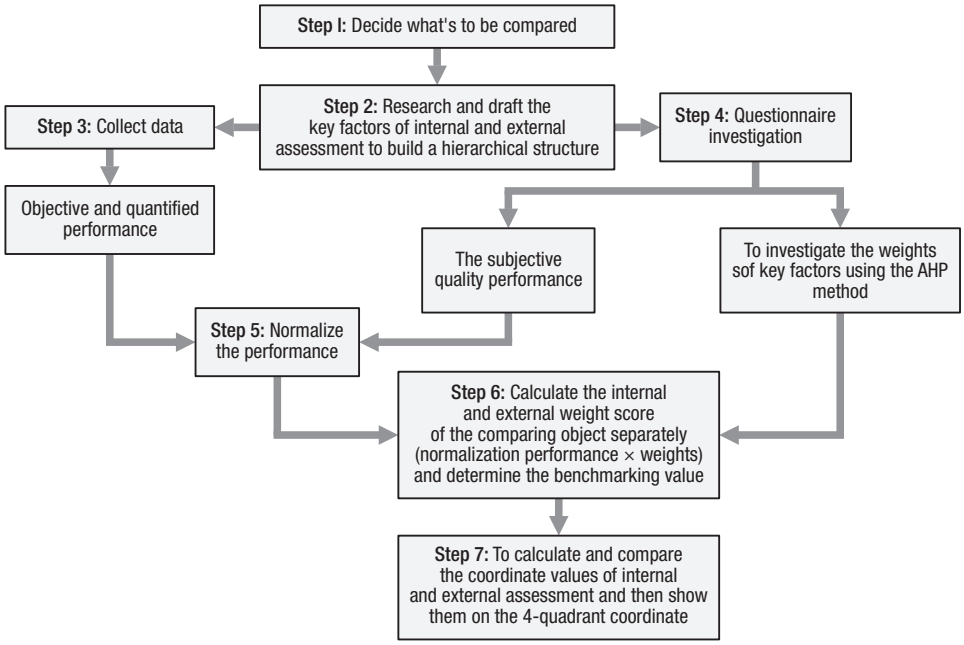

Fig. 7. Flowchart of Quantified SWOT analysis pattern (Chang and Huang 2006)

Using Analytic Network Process (ANP) instead of AHP in a hybrid method was the latest contribution to this area (Feglar *et al.* 2006; Yüksel, Dagdeviren 2007). In addition, Zaerpour *et al.* (2008) have integrated Fuzzy AHP and SWOT method. So these modeling became more realistic and at the same time they got more complicated. Let's remember that the core of strategic management (linking technique to worldview) is modeling, and SWOT is a tool for simplification of complex elements of strategic thinking (Grandy, Mills 2004).

Using balanced scorecard and quality function deployment (QFD) to combine with SWOT is one of the methods considered in recent years. This algorithm that called BSQ (A hybrid of balanced scorecard, SWOT analysis and quality function deployment) with a little difference has been used by Hong Kong researchers (Lee, Ko 2000; Ko, Lee 2000; Ip, Koo 2004). Two main stages of development within the proposed systematic and holistic strategic management system are depicted in this method. The first stage is conjoining the SWOT analysis with the BSC. The SWOT is accomplished to develop the key performance indicators (KPI) with the four main perspectives of the balanced scorecard (Financial goals, Customer perspective, internal processes, Learning and growth). The second stage is to make use of the QFD methodology with the BSC›s KPIs identified as the "Whats" and the major strategies of Sun Tzu›s philosophies as the "hows" within QFD. This system is customizable for both profit and non-profit organizations to develop holistic organizational strategic plans (Ko, Lee 2000).

There is an interesting point in that procedure: SWOT is a strategy planning exercise, so it is not the kind of thing one does every month or quarter. But BSC is a method

designed for use in ongoing management, and therefore it provides an opportunity for routine use at regular intervals. Then, SWOT and BSC need the different periods of time in planning process. For solving this paradox, Ko and Lee (2000) mentioned: "Despite the fact that there are four perspectives (financial, customer, internal processes, and learning and growth) as the key elements of organizational strategies that must be measured, the BSC remains a means of effectively measuring strategy rather than a means of deciding strategy". This is the main reason that Ko and Lee (2000) feel that "the SWOT analysis serves as a great "stepping stone" to build the key performance indicators (KPI) of the BSC". In the other words, The SWOT matrix precisely identifies the critical success factors which can be implemented into the identification of the different aspects toward the balanced scorecard.

Also Ishino and Kijima (2005) have used soft systems methodology (SSM) instead of QFD to combine with SWOT and BSC. They have described a systems-based methodology called soft systems methodology for strategy communication (SSM-SC). SSM-SC employs SSM as well as SWOT and BSC maps for integrating thoughts and languages of the participants (Fig. 8). As can be seen in that Fig. 8, SWOT analysis and the BSC maps are served as two strategy communication formats, but there is a gap between the findings of the SWOT analysis and the BSC maps and there is no mechanism for synthesizing the two in that paper. This point shows the difference between two mentioned papers (Ko, Lee 2000; Ishino, Kijima 2005) in integrating SWOT and BSC.

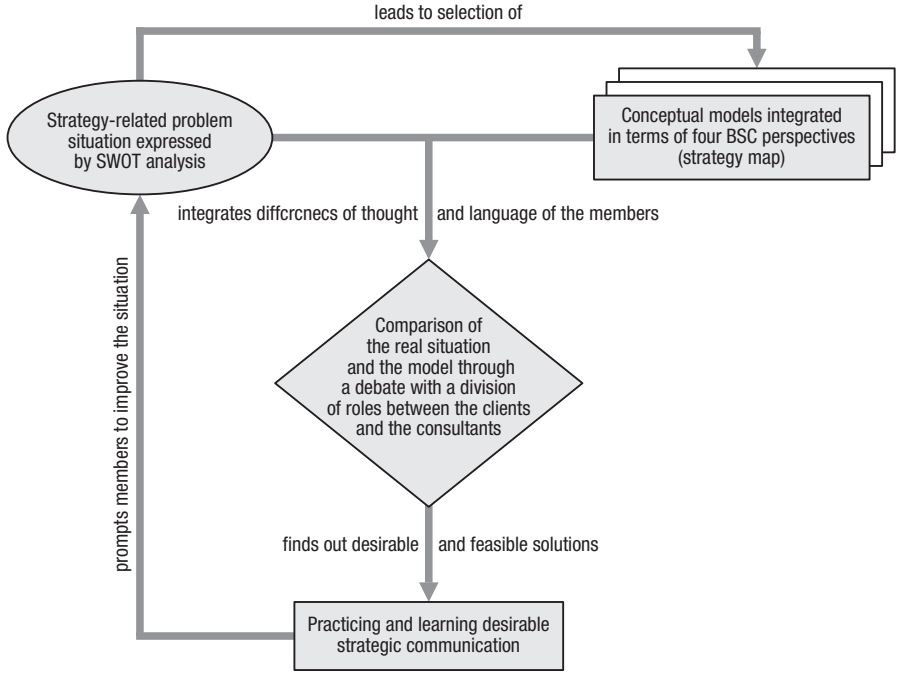

Fig. 8. The basic shape of SSM-SC (Ishino and Kijima 2005)

But in the last 4–5 years, several radical transitions in approaching on SWOT have been occurred that each one can be regarded as a radical innovation:

– Following Curry (1996) discussed knowledge-based modeling for strategic decisions, Marti (2004) introduced an extended SWOT analysis (Fig. 9) which takes into consideration the two main streams of modern strategic thought: the resource-based view and the activity-based view. This new approach used for a strategic knowledge benchmarking system (SKBC) that is a knowledge-based strategic information system framework .In addition, Dyson (2004) said: The application links SWOT analysis to resource-based planning illustrates it as an iterative rather than a linear process and embeds it within the overall planning process.

– A paper by Coman and Ronen (2009) is the most recent work in this field. That paper claims to present a straightforward methodology for making a structured analysis of strengths and weaknesses, which is done based on an analysis of important value-creating events and the strengths and weaknesses that caused these events. This focused SWOT methodology, using the core-competence tree and the current-reality tree, distils the strengths and weaknesses into core competences and core problems. These core competences and core problems are then linked into a plan of action aimed at preserving and leveraging the organization's core competences, while defending against exposure to core problems.

– Novicevic *et al.* (2004) argue: despite the wide and enduring popularity of SWOT, it has remained a theoretical framework with limited prescriptive power for practice and minor significance for research which makes both practitioners and researchers disappointed because from Novicevic *et al*.'s point of view "although SWOT generates interesting questions, it provides little guidance to managers". They also argue that

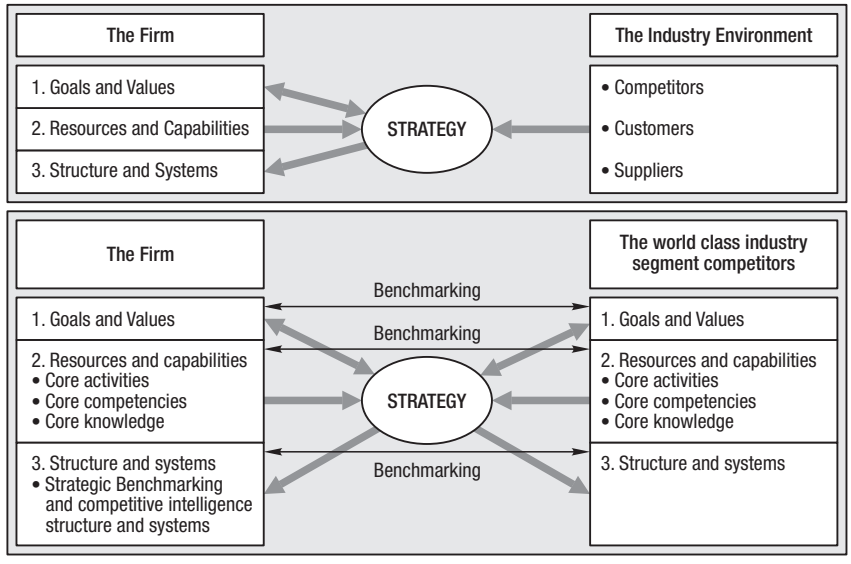

Fig. 9. Traditional SWOT analysis (top) & Extended SWOT analysis (down) (Marti 2004)

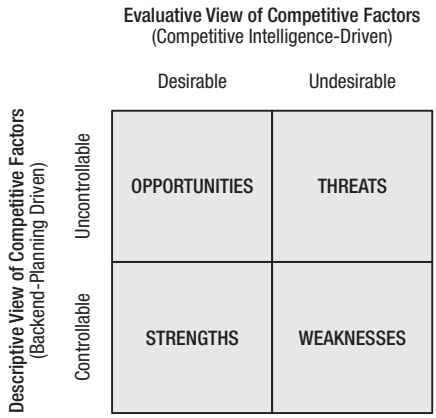

Fig. 10. Dual-perspective SWOT framework: a template for formal synthesis (Novicevic *et al.* 2004)

the functional overemphasis on SWOT "as a matching tool" has eclipsed other useful aspects of the SWOT framework and the focus of the standard SWOT framework on back-end planning has diverted attention from adding new dimensions of front-end intelligence. As they say planning requires primarily objective decision making, whereas intelligence requires primarily subjective judgments, so they conclude that practitioners and researchers need some formal template to deal with logical inconsistencies in the process of matching the four SWOT components. SWOT components need to be appropriately configured for the development of this template. This paper adopts a cognitive approach of integrating marketing and intelligence views into a new "dual-perspective" SWOT framework. It tries to recognize the difference in the underlying nature of planning and intelligence perspectives so that it can reconfigure the traditional SWOT into the dual-perspective form. The objective nature of the planning perspective calls for the situation analysis in terms of controllable and uncontrollable attributes (Fig. 10).

– Panagiotou and Wijnen (2005) believe that the SWOT's seductive simplicity leads people to use it carelessly also this analysis does not provide a sufficient context for adequate strategy optimization. they claim this sloppiness combined with structural simplicity create the fundamental failures of the SWOT analysis as a tool which only produces short lists of non-prioritized and generalized bullet points. Then they propose a composite "telescopic observations strategic framework" that is built step-by-step by integrating available conceptual frameworks and models in new relationships. In that framework, all macro-environmental factors that may affect an organization have been included in the form of an extended political-economic-social-technological analysis. The extra letters in PESTILE stand for International, to reflect competitive challenges in global markets, Legal and regulatory, and Environmental and ecological. The variables of industry analysis, cost structures, and portfolio analysis have also been included. Equally, the industry's key factors for success and the company's core resources, skills, competencies and capabilities are also present. Cooperative undertakings such as alliances, partnerships, networks and joint ventures have also been included, since they have the potential to change the competitive landscape of an organization. The user's attention is further directed to total quality management (TQM) issues, organizational cultural aspects, structural considerations, value systems needs and e-commerce considerations.
– In the last step, Ghazinoory *et al*. (2007) introduced a new point: SWOT usually reflects a person's existing position and viewpoint, which can be misused to justify

a previously decided course of action rather than used as a means to open up new possibilities. It is important to note that sometimes threats can also be viewed as opportunities, depending on the people or groups involved (Morris 2005). There is a saying, "A pessimist is a person who sees a calamity in an opportunity, and an optimist is one who sees an opportunity in a calamity". Therefore in such ambiguous cases (Emblemsvag, Kjolstad 2002) the use of fuzzy sets is justified to be applied. In fact a factor with certain membership value belongs to one of the categories. For example economic flourishing is an opportunity with 0.7 as membership value and it is a threat with membership value 0.3. Then they proposed an algorithm for rectifying the shortcomings and problems of the SWOT matrix through the use of fuzzy sets. The steps taken for this algorithm are as follows:

- *Scaling the factors;*
- *Aggregation of membership functions of internal and external factors;*
- *Evaluation, prioritization and extracting strategies.*

In that algorithm, by quantifying the factors through the definition of fuzzy membership functions, evaluation of the factors and strategies is made possible and both qualitative and quantitative aspects of the factors are considered. The major approach of the presented algorithm was that in most cases the internal and external factors can't be fully recognized as positive or negative, because their impact on the organization could be observed within a wide spread which may include both positive and negative effects. On the other hand, the aggregation of internal and external factors which leads to extract a strategy in a usual matrix would depend on the intensity and influence of the factors in this algorithm. Hence, these fuzzy membership functions and the extracted strategies can be well prioritized and it may be possible to concentrate upon strategies with higher priority in implementation stage.

An applied example of implementation of this approach is seen in Kheirkhah *et al.* (2009).

6. Conclusion remarks

6.1. Remarks on trends in publishing SWOT papers

The diversity of SWOT scopes is an interesting issue (Table 7). In fact, SWOT analysis has already been used in most of sectors at least in one case. Also none of the planning tools has been generalized to this extent. If someone wants to compare planning and mathematic knowledge, he can consider SWOT as four basic arithmetic operations (i.e. addition, subtraction, multiplication and division). However it is interesting that the number of SWOT papers on "health"" and "medicine" sectors is considerable.

The same diversity is observed in scientific journals. For example 557 papers from 424 journals have been published from different disciplines. These papers are not limited to management field, SWOT papers are found in different databases including papers on various fields of science

The review of the papers shows that the authors are from different disciplines and a lot of papers have two or more authors. Therefore team working and interdisciplinary collaboration in SWOT papers is prevalent.

It is noticeable that the number of UK papers is the same as USA papers (Table 2). Also another interesting point is about India which occupies the third place. A search in Google trends (www.google.com/trends) shows an interesting point: the most of the search was done by Taiwan, Thailand, Indonesia and Malaysia. So we can conclude that the number of submitted SWOT papers from these countries will increase rapidly in the near future.

The limited number of authors who have more than one paper (Table 4) indicates that the specific research scope is not limited to a few authors.

The position of Weihrich, H. as the pioneer of SWOT concept within other authors is notable (Table 5), because we still see that a lot of passages are cited from his paper (Weihrich 1982) by other authors. In addition, team working of Finnish (Kangas, Kurttila, Kajanus, Pesonen, etc.) and Jackson and his colleagues is remarkable.

The quick and exponential growth of SWOT papers in recent years implies the idea that "SWOT does not need to be recalled"!

Most of the reviewed papers used SWOT in a case study and/or some of them developed its methodology (Fig. 3). The papers personalized the methodology of SWOT based on a special case is only 4%. So, more work should be done in this area.

6.2. Some remarks on SWOT methodology

SWOT concerns can be divided into two categories:

- The first category deals with problems in implementation of SWOT within organization. These concerns can be solved only by organizing and training the panel of SWOT effectively. Unfortunately only a few papers have paid attention to this area in order to solve these flaws and it should get more attention than before.
- The second category deals with scientific concerns which we discussed in details in section 4. Some of the trends in this area are:
  1 – Integration of SWOT with other scientific techniques specially decision making and quantifying techniques;
  2 – Making intelligent SWOT by using corresponding techniques (which is more ingenious and it is a more recent trend);
  3 – Time dynamism of SWOT needs more attention and usually gets neglected by most of the authors. The most important question about this trend is ‚how can today's management extract tomorrow strategies based on S, W, O and T factors of yesterday?'. Although Weihrich's paper in 1982 mentioned this problem and proposed its solution but fellow researchers did not put any further effort to this issue;
- It is clear that a lot of SWOT flaws have been rectified by researches conducted so far, but those researchers overlooked the most important advantage of SWOT: simplicity!
- It is obvious that integrating the empirical and mathematical techniques within SWOT to fixing its flaws or malfunction makes its application complex. This is a key issue when researchers use SWOT technique.

6.3. General remarks

It is clear that the use of SWOT in papers and planning researches will be continued in coming years. This argument is based on reviewing the trend of papers have been published so far and its continuation and reviewing the trend of SWOT evolution. However this conclusion is based on the main advantage of SWOT approach in strategic planning:

Basically, SWOT is a logical approach on which every organization should assess its external and internal environments to adopt its strategy. On the other hand SWOT is located between the scenario planning and resource base approaches.

Based on the above, we predict that the application and methodology of SWOT will be developed in coming years, and therefore much research will be done in this area.

6.4. Prerequisites for effective application of SWOT

In this stage, there is a question: What are the conditions under which a SWOT analysis can create maximum value?

For answering this question, we can consider two general problems of SWOT in the opinion of the most important criticizers of it (Hill, Westbrook 1997):

1 – SWOT was developed in an era of stable markets, however the major of today's markets have a dramatically dynamic nature of demand and the increasing proliferation of segments. **Of course, in our opinion, it's not always a correct rule**.

2 – "Much of SWOT usage rarely amounts to much more than a poorly structured, very general, hastily conducted exercise that produces unverified, vague and inconsistent inventories of factors regarded by the proposing individuals as most important components of their organization's strategic situation". It is clear that imprecise or vague reference in such an analysis to factors external and internal to an organization will always detrimentally affect communication and verification of proposed factors and thus lead to inferior outcomes of strategic analysis. It appears that this common flaw in SWOT analysis is caused mainly by misconceived SWOT deployment, insufficient levels of skills and diligence, and strategic information gaps, **no by the nature of SWOT!**

For solving these problems, we suggest a model for the conditions which a SWOT analysis can have maximum effectiveness under them (Fig. 11).

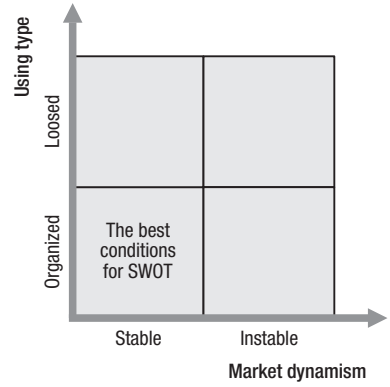

Fig. 11. Proposed model for the best conditions for SWOT

6.5. Two suggestions and one challenge on future researches[5]

In many cases, extracted strategies are not limited to ST, WT, SO and WO and the strategies could be extracted from triple factors: WTO, SOW, etc. So we propose creating a joint area between SO, ST, WO and WT cells and considering the integrative strategies in this area.

In most of the strategic planning models, the objectives are determined before SWOT analysis. Therefore the strategies should be extracted to reach the objectives. In this regard, we suggest considering objectives in an appropriate place in SWOT matrix (Fig. 12).

Fig. 12. Proposed modifications on SWOT matrix

According to above figure, a key question comes to mind: whether the strategies have to be extracted based on the determined objectives, and then their validity gets evaluated in comparison with S, O, W and T factors?

Or if the strategies have to be extracted based on four factors and then their conformity should be assessed by the objectives? What can we do if a contradiction occurs? Which one should be changed: the objectives, the strategies or the factors?

If the answer to this critical question is not met and the link between strategies and objectives is not established effectively, all over strategic planning process will face to this challenge.

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SSGG METODOLOGIJA: PRAEITIES IR ATEITIES ANALIZĖ

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Santrauka

Straipsnyje nagrinėjama SSGG metodologijos samprata, apibūdinama kaip vidinės ir išorinės aplinkos tyrimas, pagrįstas silpnybių, stiprybių, galimybių ir grėsmių identifikavimu. Pateiktoji SSGG analizės literatūros apžvalga yra pagrįsta 557 straipsnių, pateiktų įvairiose duomenų bazėse, analize. Visi nagrinėti straipsniai buvo publikuoti 2009 m. Pristatoma SSGG istorinė raida, aiškinami tyrimai ir kryptys, klasifikacija, žurnalai, kuriuose publikuojami tokio pobūdžio straipsniai, šalys, metai, autoriai, kontekstas, pritaikomumas ir jų sritys. Analizuojama SSGG metodologinė raida. Straipsnio pabaigoje pateikiamos išvados ir būsimų tyrimų gairės.

Reikšminiai žodžiai: SSGG, žurnalų apžvalga, praeitis, strateginis planavimas, strategija.

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